

held at Preston on April 11, remarked, in reference to the American institutions of this kind, that in the one at Brooklyn the following aims have been kept in view:—(1) to employ objects attractive and interesting to children, and at the same time helpful to teachers in every branch of nature-study; (2) to secure an arrangement at once pleasing to the eye, expressive of fundamental truth; (3) to avoid confusion from the use of too many specimens, and the consequent close crowding in cases; (4) to label with brief descriptions, expressed in simple language and printed in clear, legible type. The keeping of live animals is an important branch of the work, and a source of endless interest to the young visitors. A striking exhibit is a series of historic models illustrating the six chief types of people who formed permanent settlements in North America.

A SCHEME is under consideration for the establishment of a university in Hong Kong. Mr. Mody has placed at the disposal of Sir Frederick Lugard, the Governor of Hong Kong, a sum of 15,000*l.* for the purpose. At a recent meeting, according to Reuter's agent, Sir Frederick Lugard said he is willing to recommend the Government to provide a site, but cannot go further than that in view of the liabilities of the Government. He believes that if Hong Kong could establish a university with facilities equal or superior to those at Tokio, it would attract a large number of the wealthy Chinese students who now go to Japan, America, and Europe, and would increase the prestige and influence of Great Britain throughout the Chinese Empire. To provide an adequate endowment for even the modest beginning proposed, a sum of not much less than 100,000*l.* will be required.

THE treasurer of University College, Bristol, has received a donation of 550*l.* from the University College Colston Society for general purposes, and a grant of 50*l.* from the Board of Agriculture to enable the department of economic biology to carry on its investigations on the effect of electricity on plants. The County Council of Somerset has approved a scheme of research in connection with Cheddar cheese-making, and has authorised an expenditure of 200*l.* for the first year on this work. The Gloucestershire County Council has passed the following resolution in support of the movement for the establishment of a university in Bristol:—"That this council approves of the scheme for promoting the Bristol University, and will consider what, if any, financial assistance they can accord to it when the scheme is more fully developed."

In an address at the graduation ceremony of the University of Edinburgh on April 10, Prof. Chrystal referred to reforms in secondary and university education in Scotland. In 1886 Prof. Chrystal placed before the Scotch Education Department a scheme for a general leaving certificate examination for schools. The department approved the suggestion, and Sir Henry Craik carried out the scheme in detail with very satisfactory results. Prof. Chrystal now proposes to make the Scotch Leaving Certificate examination the normal course of entrance to each university, and to abolish the university preliminary examination. Already the leaving certificate examination is accepted by Scotch universities in lieu of the preliminary examination for the subjects it covers, and it is desirable to make the examination a complete passport to the universities. Part of Prof. Chrystal's original proposal to the Scotch Education Department regarding the leaving certificate was the creation of a National Board of Surveillance, on which the department, the schools, the universities, and certain other public bodies were to be represented. His object was to avoid the necessity for the institution of a university preliminary examination. A generally accepted standard for entrance to the University is an inevitable element in university reform; but the administration of a general leaving examination for schools is not the proper business of the universities. No doubt one of the functions of a leaving certificate should be to qualify for an academic course, but it has many other functions besides, and all that the universities should claim is a share in the surveillance of the leaving certificate in so far as it concerns them. Prof. Chrystal went on to say that the advance of secondary education, in par-

ticular the opening of junior student centres all over Scotland, is rapidly preparing the way, if it has not already prepared it, for carrying out the ideal of the Universities' Commissioners. "I turn, therefore, with renewed hope and renewed insistence to the men of wisdom and of influence, who hold in their hands our educational destiny, and ask them to consider once more my old proposal for a National Board, which shall regulate the schools' leaving certificate, so that it shall become the normal portal of admission to the universities, and render the present preliminary examination and the present Joint Board and all its works unnecessary. This reform must, of course, be taken up as a national affair. It is no matter of the autonomy of the universities. It concerns the welfare and good government of all the secondary schools of the country; also, I may say, the relation of our standards of secondary education to similar standards all over the British Empire."

SOCIETIES AND ACADEMIES.

LONDON.

Linnean Society, April 2.—Lieut.-Colonel Prain, F.R.S., vice-president, in the chair.—The anatomy of some sapotaceous seedlings: Winifred **Smith**. The seedlings of the Sapotaceæ are remarkable on account of (1) their exceptional mode of transition from root to stem; (2) the lack of continuity in the different parts of the vascular system; (3) their tendency to a geophilous habit. To Dangeard's axiom:—"Le plan vertical médian des cotylédons correspond toujours à un faisceau vasculaire de la racine," the sole exceptions vouched for are trees, and occur in the Sapotaceæ and in two genera of the Fagaceæ.—Notes on some sponges recently collected in Scotland: Dr. N. **Annandale**.

Society of Chemical Industry (London Section), April 6.—Dr. Lewkowitsch in the chair.—Considerations affecting the "strength" of wheat flours: Julian L. **Baker** and H. F. E. **Hulton**. It is improbable that any one chemical or physical determination can be used for determining the "strength" of flours, as the generally accepted definition includes two distinct qualities, viz. size and shape of loaf. It is recommended that bakers should apportion marks independently for size and shape. A proteolytic enzyme capable of degrading the gluten, and so influencing the character of the loaf, appears to be absent, but there is a small quantity of an erepsin. Yeast enzymes can effect partial proteolysis of gluten. Aqueous flour extracts depart from Kjeldahl's law of proportionality. Maltose is the sole sugar formed during doughing. Flours on keeping display changes in enzymic activity. Doughs have a greater diastatic activity than either the aqueous extract of the flour or the flour itself, and this activity varies inversely with the amount of water present. Flours contain a starch-liquefying enzyme, and this enzyme is closely connected with gas production. The formation of gluten from gliadin and glutenin is independent of enzymic activity, and is probably only a hydration phenomenon. Gliadin separated from flour was re-combined with the residual gluten and starch, and the gluten, in a weakened condition, was recovered by washing out. The diastatic activity of gluten is confirmed, and shown to reside in the glutenin moiety.—The occurrence of cyanogenetic glucosides in feeding stuffs: T. A. **Henry** and S. J. M. **Auld**. In association with Prof. Dunstan, the authors have investigated a number of plants which yield prussic acid when in contact with water, and show that the prussic acid is formed by the interaction of a glucoside and an enzyme which decomposes it, liberating prussic acid. Several of these plants are employed as feeding stuffs, notably Java beans, and it is to this liberation of prussic acid that the numerous cases of poisoning of cattle by these beans are due. Linseed cake also contains a cyanogenetic glucoside, but the high temperature to which the cake is heated in the course of manufacture destroys the enzyme originally present in the seed. The seed of the Para rubber tree, sometimes used for feeding purposes in the tropics, also yields small quantities of prussic acid.—Note on murexide as a quondam dye-stuff and printing colour: Watson **Smith**. The author exhibited a specimen

of commercial murexide manufactured about the year 1861, and also a specimen of calico printed with it, which still exhibited the characteristic bright rose tint.

Zoological Society, April 7.—Dr. Henry Woodward, F.R.S., vice-president, in the chair.—A monograph of the chiropteran genera *Uroderma*, *Enchisthenes*, and *Artibeus*: Dr. Knud Andersen. The work was based on an examination of the material in the British and United States National Museums, and contained a discussion of the homologies of the teeth and molar cusps in steno-dermatous bats, a full description of the genera mentioned in the title, their species and subspecies, with a discussion of their probable inter-relations, and, finally, remarks on the bearing of the present geographical distribution of the species and subspecies on a former connection of the West Indian Islands with continental America.—Certain points in the structure of the cervical vertebrae of the okapi and giraffe: Sir E. Ray Lankester. The paper dealt chiefly with the posterior cervical and anterior dorsal vertebrae, the author concluding that where the okapi differed in these respects from the giraffe, it resembled other, and particularly bovine, Artiodactyles. It also included a discussion of the zygapophysial articulations of the cervical and dorsal vertebrae in the giraffe, okapi, and some other mammals.—Some Australian spiders: H. R. Hogg. The author gave further notes on the type species of the genus *Missulena*, hitherto known only by two specimens, a synopsis of the New Zealand genus *Hexathele*, with description of two new species, and a description of two new species of *Dolomodes* (Latreille) from Pitt Island of the Chatham Group, showing affinities with the only two species recorded from New Zealand.

Association of Economic Biologists, April 15.—Mr. A. E. Shipley, F.R.S., president, in the chair.—The pecking of fowls and their vision: E. Steains.—The inter-relation between entozoa and their hosts: A. E. Shipley. The author emphasised the important rôle internal parasites play in disease, the full weight of which had scarcely been realised as yet by the medical profession.—The predispotion of plants to parasitic diseases: H. T. Güssow.—The need of an organised inquiry into the feeding habits of British birds: C. Gordon Hewitt.—The possibility and danger of the introduction of the San José scale into Great Britain: Walter E. Collinge. The author had seen this scale alive on pears in this country, and twigs had been sent to him from Canada on which the insects had reproduced by eggs, and hatched out in his laboratory. In view of its spread northwards in Canada, he was of opinion that some stricter and more careful examination of imported nursery stock should without delay be organised and carried out in this country.—An important factor in the natural control of the large larch saw-fly, *Nematus erichsonii*: C. Gordon Hewitt. The factor referred to was the field vole (*Arvicola agrestis*), which extracts and eats the larvae from the cocoons.

Royal Meteorological Society, April 15.—Dr. H. R. Mill, president, in the chair.—Report on the phenological observations for 1907: E. Mawley. Wild plants came into blossom behind their usual dates throughout the whole of the flowering season. Such early immigrants as the swallow, cuckoo, and nightingale were also behind their average dates in reaching these islands. The only deficient farm crop, taking the country as a whole, was that of potatoes, most of the other crops being much over average. On the other hand, the yield of apples and pears, and particularly that of the former, was below average. There was also a deficient crop of strawberries, whereas plums, raspberries, currants, and gooseberries were over average.—Anticyclonic belt of the southern hemisphere: Colonel H. E. Rawson. From an examination of the daily synoptic charts of the northern hemisphere, the author was led to the conclusion that some of the permanent anticyclonic systems had a progressive seasonal movement which did not take place along the same latitude each year, but was in some years north and in others south of a mean latitude. This was noticeable in the years 1881–1891, and was capable of easy explanation if the belt itself in which they moved shifted its latitude from year to year in addition to migrating north and south with the sun. On analysing the isobaric charts of the southern

hemisphere, the author found the seasonal migration of the anticyclonic belt to be accompanied by a real displacement of the action-centres within it to the northward and to the southward. It appears that there is a period of about 9.5 years between the greatest north and greatest south position of the anticyclonic belt over South Africa, the double oscillation thus taking nineteen years.

MANCHESTER.

Literary and Philosophical Society, February 11.—Prof. H. B. Dixon, F.R.S., president, in the chair.—A method of counting the number of α particles from radioactive matter: Prof. E. Rutherford and Dr. H. Geiger. The total number of α particles expelled per second from one gram of radium has been estimated (Rutherford, *Phil. Mag.*, August, 1905) by measuring experimentally the total positive charge carried by the α rays from a thin film of radium, on the assumption that each α particle has the same charge as an ion produced in gases. If the α particle is an atom of helium, it is necessary to assume that each α particle carries twice the ordinary ionic charge. The need of a method of directly counting the number of α particles shot out from radioactive matter has long been felt in order to determine with the minimum of assumption the charge carried by the α particle, and also the magnitude of other radio-active quantities. It can be calculated that an α particle expelled from radium produces about 80,000 ions in a gas before its ionising power is lost. With very sensitive apparatus, it should be just possible to detect the ionisation produced by a single α particle by electrical methods. The effect, however, would be small and difficult to measure with accuracy. In order to overcome this difficulty, the authors have employed a method which automatically increases the ionisation produced by an α particle several thousand times, and so makes the electrical effect easily observable with an ordinary electrometer. By counting at intervals the number of α particles expelled per minute, the authors have been able to obtain the curves of decay of activity of a plate coated with radium C or actinium B. The α particles from a constant source are shot out at irregular intervals. The time interval between the entrance of successive α particles has been observed over a long interval, and the results show that the distribution curve with time is similar in general shape to the probability curve of distribution of the velocity of molecules in a gas.

February 25.—Prof. H. B. Dixon, F.R.S., president, in the chair.—Notes on the greater horseshoe bat (*Rhinolophus ferrumequinum*) in captivity: T. A. Coward. The author, after giving a résumé of his previous notes on the habits of the greater horseshoe bat, showed that the conclusions he arrived at were confirmed by the behaviour of examples in captivity. The winter sleep of this species is not profound; the bats leave their retreats and feed in mild weather. Bats in captivity usually awoke every evening, but during the cold weather in January slept occasionally for one, two, or three nights. When awake they captured insects on the wing, and also, though unable to walk, dropped on the floor, seized beetles, and rose with them in their mouths without difficulty, proving how the bats are able to obtain flightless insects.—Cavity parenchyma and tyloses in ferns: Mary McNicol.

March 10.—Dr. W. E. Hoyle, vice-president, in the chair.—Report of the recent Foraminifera from the coast of the island of Delos (Greecian Archipelago), part v.: H. Sidebottom. The author restricted himself to a consideration of two forms (*Cymbalopora bulloides* and *Spirillina erecta*) as being of special interest, and described them in some detail.—The action of selenium and tellurium on arsine and stibine: F. Jones. In a previous paper it was shown that sulphur decomposes stibine in presence of light, and at a temperature of 100° C., but not in the dark. The action results in the formation of hydrogen sulphide and antimony trisulphide. It was also shown that the liberated hydrogen sulphide decomposes stibine with formation of antimony trisulphide and free hydrogen. A similar action was found to take place between sulphur and the two gases analogous to stibine, namely, arsine and phosphine. It appeared probable that selenium and tellurium would act on these gases in a similar manner to sulphur, and this has been found to be the case.

PARIS.

Academy of Sciences, April 13.—M. H. Becquerel in the chair.—The hovering of birds: Marcel **Deprez**. The author gives a simple mechanical explanation of the motionless hovering of birds, and has constructed an apparatus capable of imitating this flight.—The determination of longitude at sea by wireless telegraphy: E. **Guyou**. The views of the Bureau des Longitudes on this subject are stated, especial emphasis being laid on the necessity for international control.—The action of heat on the hydrates of lithia: M. **de Forcrand**. A description of the methods employed in obtaining LiOH , $\text{LiOH}\cdot\text{H}_2\text{O}$, and Li_2O in a state of purity, together with some thermochemical data relating to these substances.—The adiabatic expansion of saturated fluids: E. **Mathias**.—An extremely sensitive electric hygroscope: J. **Pionchon**. A glass tube is silvered over the whole of its internal surface, and externally from one end to within about a centimetre of the other. This tube is placed in circuit with a mirror galvanometer and a battery of 100 volts. The resistance of the unsilvered portion of the tube varies with the amount of moisture present in the air, and forms a very sensitive hygroscope.—The magnetic changes in the spectrum of silicon fluoride observed parallel to the field: A. **Dufour**. It has been possible to separate the bands into three groups, in two of which the Zeeman effect is abnormal, or in a sense agrees with the existence of positive electrons.—The evaporation of water and solutions of sulphuric acid: P. **Vaillant**. A study of the effect of modifying some of the conditions in the gravimetric method described in a previous paper.—A new method of estimating phosphorus in organic materials: Isidore **Bay**. The substance is burnt in a bayonet tube with sodium carbonate and magnesia. Comparative results with this and the Carius method are given for trimethylphosphine and triethylphosphine.—The sulphur compounds of thorium: A. **Duboin**. By the action of sulphuretted hydrogen upon thorium chloride in presence of sodium chloride at a red heat, two new compounds were isolated. On analysis, these proved to be ThS_2 and ThOS .—Semicatalysis: the oxidation of hydrocarbons in air in presence of phosphorus: Albert **Colson**. Solutions of phosphorus in turpentine become oxidised in presence of air, and both the hydrocarbon and the phosphorus are oxidised simultaneously. The product $\text{H}_3\text{PO}_4(\text{C}_{10}\text{H}_{16}\text{O}_3)_2$ was isolated.—A simple reaction producing a disinfectant gas: G. **Carteret**. A mixture of bleaching powder and paraformaldehyde gives a vigorous evolution of gaseous formaldehyde when mixed with water.—The alloy of platinum with thallium: L. **Hackspill**. A description of the preparation and properties of the alloy TiPt .—Austenite: Ed. **Maurer**. Starting with a metal containing 2.2 per cent. of manganese, 1.94 per cent. of carbon, and 0.94 per cent. of silicon, heating for fifteen minutes at 1050°C ., and tempering in ice-cold water, the author has been able to obtain pure austenite for the first time. Reproductions of photomicrographs are given showing pure austenite, the same after deformation and after tempering at 400°C . This steel is not magnetic, and is of relatively small hardness. It can be converted into martensite by mechanical treatment at the ordinary temperature, by re-heating to 400°C ., or by immersion in liquid air.—Remarks on the communication of M. Maurer relating to austenite: H. **Le Chatelier**. The previous attempts to prepare austenite are detailed, and the theoretical and practical importance of M. Maurer's discovery pointed out.—The electrical transport of inorganic colloids: André **Mayer** and Édouard **Salles**.—Helicoidal structures: Paul **Gaubert**.—Observations on the development of the pistil in the Malvaceæ: Jean **Friedel**.—The cytological peculiarities of the development of the mother cells of the pollen of *Agave attenuata*: Er. de Lary **de Latour**.—The morphological and anatomical connections of the human cardia: R. **Robinson**.—The thoracic nephridia of the Hermellids: Armand **Dehorne**.—The structure of the epidermis of *Travisia Forbesii*: Louis **du Reau**.—Culture of the parasite of the Biskra boil (*bouton d'Orient*): Charles **Nicolle**.

DIARY OF SOCIETIES.

THURSDAY, APRIL 23.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—*Conclusion of Discussion*: Electric Supply Prospects and Charges as affected by Metallic Filament Lamps and Electric Heating: H. W. Handcock and A. H. Dykes.

MONDAY, APRIL 27.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*James Forrest Lecture*: On some Unsolved Problems in Metal Mining: Prof. H. Louis.

TUESDAY, APRIL 28.

ROYAL INSTITUTION, at 3.—The Development of the Modern Turbine and its Application: Gerald Stoney.

ZOOLOGICAL SOCIETY, at 8.30.—On the Amphipod Genus *Trischizostoma*: Mrs. E. W. Sexton.—On the Breeding-habits of a Cichlid Fish (*Tilapia nilotica*): C. L. Boulenger.—A Revision of the Sharks of the Family Orectolobidae: C. Tate Regan.—A Revision of the Oriental Pelobatid Batrachians (Genus *Megalophrys*): G. A. Boulenger, F.R.S.

ROYAL SOCIETY OF ARTS, at 8.—Lace as a Modern Industry: Miss Isemonger.

WEDNESDAY, APRIL 29.

ROYAL SOCIETY OF ARTS, at 8.—Modern Roumania: Alfred Stead. SOCIETY OF DYERS AND COLOURISTS (London Section), at 8. The Dyeing and Colouring of Paper Pulp: R. W. Sindall.—Further Notes on the Germicidal Value of Petroleum Benzene: F. J. Farrell and F. Howles. BRITISH ASTRONOMICAL ASSOCIATION, at 5.—Time: Capt. F. L. Grant.

THURSDAY, APRIL 30.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: On Scandium: Sir William Crookes, F.R.S.—Note on the Representation of the Earth's Surface by Means of Spherical Harmonics of the First Three Degrees: Prof. A. E. H. Love, F.R.S.—On the Hysteresis Loss and other Properties of Iron Alloys under very small Magnetic Forces: Prof. E. Wilson, V. H. Winson, and G. F. O'Dell.—The Relation between the Crystalline Form and the Chemical Constitution of the Picryl Derivatives: G. Jerusalem and Prof. W. J. Pope, F.R.S.—The Condensation of Certain Organic Vapours: T. H. Laby.—A Photographic Determination of the Elements of the Orbits of Jupiter's Satellites: Bryan Cookson.

ROYAL INSTITUTION, at 3.—Mendelian Heredity: William Bateson, F.R.S.

ROYAL SOCIETY OF ARTS, at 4.30.—Reminiscences of Indian Life: Lord Lamington, G.C.M.G., G.C.I.E.

MATHEMATICAL SOCIETY, at 5.30.—On a General Convergence Theorem, and the Theory of the Representation of a Function by Series of Normal Functions: Dr. E. W. Hobson.—On the Multiplication of Series: G. H. Hardy.—On q -Integration and Differential Equations: F. H. Jackson.

FRIDAY, MAY 1.

ROYAL INSTITUTION, at 9.—The Scientific Work of Lord Kelvin: Prof. Joseph Larmor, Sec.R.S.

SATURDAY, MAY 2.

ROYAL INSTITUTION, at 3.—Chile and the Chilians: G. F. Scott Elliot.

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